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October 1971 □ Technical Report 72-2

**AVIATION SAFETY IN COMBAT:  
An Appraisal of the Experiences of  
Army Aviation Unit Commanders in RVN**



**APPLIED RESEARCH DIVISION**

TECHNICAL RESEARCH AND APPLICATIONS DEPARTMENT  
U.S. ARMY BOARD FOR AVIATION ACCIDENT RESEARCH  
FORT RUCKER, ALABAMA

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Technical Report 72-2

**AVIATION SAFETY IN COMBAT: AN APPRAISAL OF THE  
EXPERIENCES OF ARMY AVIATION UNIT COMMANDERS IN RVN**

Prepared by

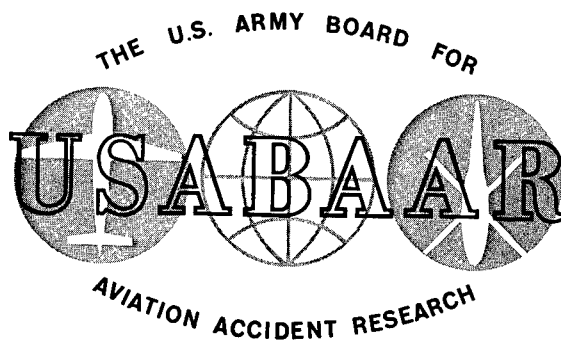
Applied Research Division  
Technical Research and Applications Department

October 1971

Approved by

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Chief, Technical Research and  
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for Aviation Accident  
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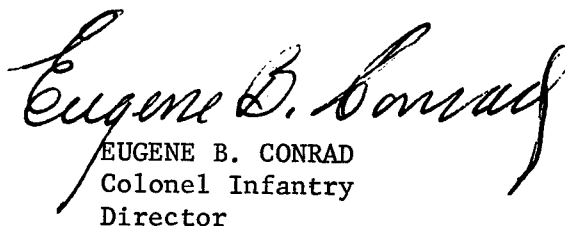


The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

## FOREWORD

This report presents an appraisal of the opinions of aviation commanders serving in RVN on matters of safety. The research was carried out under USABAAR Project 71-527, Commander's Opinion Survey, and is the first in a continuing series. This series was initiated to provide crucial accident prevention feedback to operational aviation units and to personnel and activities engaged in aviation accident prevention research.

The study discloses a consensus of commander's opinions about critical aviation safety issues arising during Army aviation's dramatic growth in response to the demands of the conflict in RVN. The information presented is analyzed and organized in such a manner that commanders, from platoon to brigade level, can ascertain the opinions of commanders at their own level, as well as those at all levels, about the issues most important to their mission. Perhaps the most significant aspect of the findings is the trend revealing a transition in accident prevention attitudes from "each aviator is his brother's keeper" to overwhelming support of "vigorous enforcement." This trend indicates a need for a more positive approach toward aviation accident prevention. It is hoped this report will further serve to document accident prevention lessons learned in combat so that they may be used to prevent the repetition of past mistakes in future conflicts.

  
EUGENE B. CONRAD  
Colonel Infantry  
Director

## SUMMARY AND CONCLUSIONS

Purpose. The recent dramatic growth of Army aviation and unique combat environment of RVN have given rise to critical aviation safety issues. However, no consensus of opinion emerged and time now is ripe to uncover the aviation safety lessons learned from RVN. Therefore, the research described here had as its purpose to solicit, analyze and report the collective opinion of unit commanders and aviation safety officers (ASO's) on the evolution of aviation safety philosophy from peacetime operations through six years of combat operations.

Method. A questionnaire was developed and included 45 items derived from RVN oriented conferences, interviews and accident reports. Copies (1141) of the questionnaire were mailed to 156 aviation units in RVN during March 1970, and by July 1970 197 unit commanders and 131 ASO's had responded. Background of the respondees indicated this sample was representative of commanders at each unit level in RVN.

Findings and Conclusions. Headings under which the findings/conclusions appear represent basic areas of aviation safety interest. These headings transcend the more specific headings of this report's text but the specific questions from which these findings/conclusions were derived are identified in parenthesis.

### Aviation Safety Philosophy Change:

(a) A significant change in Army aviation safety philosophy is evidenced by the dramatic shift away from the concept of forgiving-and-forgetting accidents toward vigorous enforcement of aviation safety. (5,16,18,19,20)

(b) This change in philosophy perhaps was due to the increased risk-taking behavior of the large number of relatively inexperienced aviators utilized in RVN combat. (1,2,28,29,32,39)

#### Unnecessary Risk-Taking:

(c) In the RVN combat environment, with relatively inexperienced aviators and commanders, risk-taking beyond sound principles of flight occurs too frequently in (1) the misuse of tactical urgency, (2) the inability of inexperienced aviators to properly trade off mission accomplishment for safety, (3) accepting maintenance deficient aircraft, (4) staging troops in POL areas, and (5) not consulting maintenance authorities following precautionary landings. (28,29,30,31,32)

#### Developing a Proper Safety Attitude:

(d) One reason aviators take unnecessary risks is because most lack a basic understanding of aviation safety and the Army accident prevention program. Further, this deficiency handicaps accident prevention programs at unit level and aviation safety is recommended for inclusion as a course in flight school. (8,9,10)

(e) Safety attitudes (especially those of inexperienced aviators) are primarily developed in operational units where unit commanders exert the strongest influence through control of operational practices and procedures. (1,2)

#### Enforcing Aviation Safety:

(f) As methods for enforcing accident prevention programs, commanders approve collateral investigations but disapprove both of accident rate

ceilings for units and authorization for USABAAR to request flight evaluation boards based on accident report findings. (6,7,44,45)

(g) As aids in enforcing aviation safety, the most qualified ASO's are at higher levels of command where they receive adequate command support. However, more trained/experienced aviation safety personnel are required closer to the flight line. (13,14,17)

(h) To relieve the shortage of qualified/trained aviation safety personnel, a TO&E authorized ASO position and an NCO aviation safety career field are required. (12,15)

#### Aviator Proficiency Requirements:

(i) Annual written exams may be open or closed-book but should cover standard and emergency procedures on the specific aircraft flown most frequently. (18,19)

(j) Both basic-skill (standardization) and mission-oriented (tactical) check rides are required for combat proficiency and should include demonstrations/practice of most-likely-to-be-needed emergency procedures. However, commanders are divided on whether these two check rides can safely be combined on one flight. (20,21,22,24)

(k) Aviators need all the instrument proficiency they can acquire but commanders would rather have aviators awarded standard tickets or none at all. This finding reveals how widespread the great value of tactical tickets is misconceived. (38,39)

(l) The clearance authority of special or standard instrument tickets requires no regulatory change, and flights into marginal (1000'/3 miles to



500'/1/4 mile) weather can remain the responsibility of instrument-certified aviators but flights into weather below 500'/1/4 mile minimums should be cleared by the unit commander/designee. (33,34,35,36,37)

(m) IP's should instruct no more than four flight hours daily, should have a rest period between flights and, with approval of the unit commander, can decide how many practice touchdown autorotations to perform/instruct daily (USABAAR recommends no more than six per hour under rigidly controlled conditions). (25,26,27)

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## INTRODUCTION

This report presents an appraisal of approximately 300 Army aviation unit commanders' opinions on subjects critical to aviation safety. These commanders were surveyed by questionnaire between March 1970 and July 1970 while serving in the Republic of Vietnam (RVN).

Many issues about aviation safety practices have arisen during the recent dramatic growth of Army aviation but, to date, a consensus of opinion about these issues has not emerged. The purpose of the research described herein, then, was to solicit opinions about these issues from those who have a major influence on aviation safety--aviation unit commanders in the field. The significance of this information can be measured only by the influence it has in reducing accidents when fed back to those in aviation accident research (USABAAR) and to those in the field (unit commanders and aviation safety officers).

## METHOD

Questionnaire Development. A questionnaire was developed by which the opinions of aviation unit commanders and aviation safety officers could be solicited concerning major issues in aviation safety. The issues resulting in specific items for the questionnaire were selected from RVN oriented safety conferences, interviews with returning aviators and corrective-measures comments from accident reports.

Three forms of the questionnaire were developed, AC and BC for unit commanders and AA for aviation safety officers (ASO). Forms AC and BC contained 73 questions, of which 24 sought background information. The

remaining 45 questions concerned aviation safety issues and required a response of (a) strongly agree, (b) agree, (c) undecided, (d) disagree, or (e) strongly disagree. These two forms were identical except form AC stated questions positively and form BC stated questions negatively. This procedure insured if positive or negative wording influenced responses to a question, this bias would cancel out by using responses from both forms. However, no such bias was revealed by statistical test (chi square) and both forms were considered reliable.

Form AA (ASO's) included 100 questions, of which 21 requested background information and 79 sought aviation safety information. Among the 79 safety questions, 13 were the same as those asked of commanders and were included to obtain a comparison of opinions between ASO's and unit commanders on issues of high mutual interest. In this report, ASO responses were not used in determining cumulative response percentages for all commanders or the median.

Questionnaire Distribution. The exact number of unit commanders and ASO's in RVN could not be determined due to continuous annual turnover. Therefore, commander and ASO strength of 156 aviation units in RVN was estimated and a total of 1141 questionnaires were mailed (399 of AC, 399 of BC and 343 of AA) with instructions to distribute one questionnaire to each ASO and unit commander from brigade to platoon level. Of the questionnaires distributed, 155 of form AC (39%), 142 of form BC (35%) and 131 of form AA (38%) were returned. Since the number of unit commanders and ASO's in the 156 units receiving questionnaires could not be determined, the percentage

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of all such personnel in RVN represented by this sample is not known.

Background of Responding Commanders. Appendix A presents a salient background description of the responding commanders. Each table shows a distribution of the 297 commanders by their level of command and the percentage each level represents of all responding commanders. In each table it can be seen that platoon commanders (152) are the largest group (49.5%) of the sample. However, had the sample been precisely apportioned by command level this group would have been even larger. So, the sample can be viewed as representative of the commanders at each level within aviation units in RVN. It should be noted that all background information collected from the questionnaires is not shown in Appendix A and some of the below description is based on this unreported information.

Platoon Level - The platoon commanders surveyed were mostly young rated-aviator captains having completed about three years of Army service. Most of their time in service has been spent as a rotary-wing (R/W) aviator and currently they are qualified to fly only the aircraft they pilot in RVN. If they are qualified to fly fixed-wing (F/W) aircraft, they generally fly the O-1 Bird Dog. Lastly, they have completed more than half of their first 12-month combat tour, spending most of this time as a platoon commander.

Company Level - The company commanders surveyed are stereotypes of the typical Army aviation unit commander. Mainly, they are majors, have been Army aviators about eight years, are dual rated and are in their second combat tour. Probably, they were platoon-commander captains during their first combat tour and have completed three-fourths of their current RVN

tour. They have been company commanders for four months, revealing they are rotated approximately each six months.

Battalion Level - Other than rank and years rated, the 25 battalion commanders surveyed did not appear significantly different from their counterparts at company level. They were lieutenant colonels and had been rated aviators about 12 years and their current combat tour was their second. Only one had served more than two full tours, whereas three platoon and five company commanders had completed more than two combat tours.

Brigade Level - Only four brigade commanders were surveyed. Of these, all were full colonels and dual rated aviators, two for nine years and two for 12. However, only one had more than two combat tours, two were in their second and one was in his first. Two of these colonels had completed half their current tour and none had more than six months in his present command.

Unreported Level - Of the commanders surveyed, 20 did not report command level. Of this group, the 11 captains may have been detachment commanders. The colonel and four majors are less subject to speculation. Nevertheless, responses of this unreported-level group are as valid as those of the other commanders and are included.

#### RESULTS, DISCUSSION AND CONCLUSIONS

The full results, in tabular form, are presented in Appendix B. As an aid in summarizing responses to each question, a tick (▲) on the agree-disagree scale divides responses into two groups, each representing 50% (statistical median) of the respondees. Only the positive form of each question is presented because no differences were found between responses to

positively (AC) and negatively (BC) stated questions.

The most outstanding features of the results are presented below in several major sections. Within these sections, questions of similar topic are grouped for discussion. At the end of each major section, conclusions are made and the questions from which they were drawn are identified in parenthesis.

Unit Aviation Safety Enforcement. The seven questions of this section probe unit safety enforcement by asking who is responsible for safety attitudes, why these attitudes exist and what can be done to enforce aviation safety.

*Question 1. The inexperienced aviator's attitude toward aviation safety is a reflection of the flight procedures and practices the unit employs to accomplish its operational missions.*

The purpose of this question was to verify a long standing assumption that safety attitudes of inexperienced aviators are highly influenced by practices they observe and procedures they are required to follow during operational unit assignments. A large majority (75.5%) of commanders agreed with this statement. The validity of this statement is strengthened in that those in charge of assimilating new aviators into the unit (platoon and company commanders) expressed strongest agreement. Development of the proper attitude toward aviation safety is a prime objective of the unit assimilation process and platoon/company commanders have the closest view of this developmental process.

*Question 2. The flight procedures and practices that the unit employs to accomplish its operational missions are a reflection of the unit commander's attitude toward aviation safety.*

Responses to Question 1 indicated a unit's procedures and practices influenced aviators' safety attitudes and Question 2, then, asks who is responsible for these procedures and practices. Responses evidence commanders (87.5%) and ASO's (93%) strongly agreeing that a unit's safety procedures and practices reflect the commander's attitude toward safety. In effect, then, unit commanders can easily determine the safety attitude new aviators develop and probably retain throughout their career. There is evidence in USABAAR's accident files that inexperienced aviators may take a commander's casual remark about a flight procedure as license to trade off safe flight principles for mission accomplishment; commanders must constantly be aware of the impact carried by their words, actions and even mannerisms.

*Question 3. In a combat environment, a higher accident rate should be accepted as well as expected.*

*Question 4. Only when an accident occurs do safe operations receive sufficient emphasis.*

Responses to Question 2 indicated that commanders' safety attitudes are responsible for a unit's safety practices and procedures. Questions 3 and 4 ask, then, what these commanders' attitudes actually are on two basic aviation safety issues.

Question 3 is a two-pronged question based on the assumption (first prong) that the violence, added hazards and uncertainty of combat environments puts a great deal of stress on aviators and leads to higher accident rates. Assuming this would be verified, the intent of the second prong was to determine whether commanders would simply accept such higher accident rates in a tradeoff between mission accomplishment and safety. Surprisingly,



67.5% of the commanders indicated they might expect higher accident rates but they would not simply accept them. This is an encouraging sign when interpreted that most commanders recognize the effect of combat stress on accident rates, but are not willing to trade safety off for mission accomplishment and are striving to do something about it. However, a significant number (30%) of the commanders revealed they expected and accepted higher accident rates in combat. This group is sufficiently large to account for the increase in accident rates which always seems to accompany flight operations in combat. The reason for this group expecting and accepting higher accident rates is probably some combination of the following: (a) inexperienced aviators, (b) difficult terrain turning forced landings into accidents, (c) combat stress on aviators, (d) command assignment too short to structure and implement a good accident prevention program, and (e) management and command shortcomings. Nevertheless, all commanders should recognize the safety hazards of combat environments and strive to overcome them by improving their accident prevention programs.

The rationale for including Question 4 had a dual purpose. First, it is a well recognized characteristic of human beings to "oil the wheel that squeaks." This problem is not exclusive to Army aviation for even the Apollo space program, enjoying world attention and a budget of billions, lost three astronauts to spacecraft fire before enough emphasis could be mustered to eliminate a well recognized safety hazard. Therefore, the first purpose of Question 4 was to determine how widespread this tendency was among aviation units in combat. Surprisingly, 35% of the commanders "squealed" on themselves

by agreeing that safety receives sufficient emphasis only after an accident occurs. Commanders with this opinion were distributed rather evenly over different levels of command indicating that either the tendency to oil the wheel that squeaks is a rather stable phenomenon or only 35% of the commanders are willing to squeal on themselves. Unfortunately, many (60%) of the commanders disagreeing with the statement are like the space program officials before the Apollo fire, and USABAAR's accident files contain ample evidence of aviator/aircraft losses resulting from this attitude. The second purpose of this question was to compare responses of commanders with those of ASO's. It was anticipated that some disagreement would be evidenced. The results again were surprising, but this time because of close agreement (33% agreed and 53.5% disagreed) between commanders and ASO's. This close agreement lends support to the hypothesis that oiling the wheel that squeaks is a rather stable phenomenon, but may also be interpreted as indicating only 33% of ASO's are willing to admit shortcomings of their unit's accident prevention program.

*Question 5. To be effective, an accident prevention program, in addition to being well conceived and publicized, needs to be vigorously enforced.*

Question 4 asked when the commanders devoted emphasis to safe aviation operations, and Question 5 asks how much they recommend enforcing this emphasis. Responses to Question 5 (92% agreement) disclose a dramatic shift toward recognizing the need for strong enforcement of accident prevention programs. In the past, the only enforcement evidenced in aviation safety was "appropriate" actions taken when blatant neglect resulted in accidents.

That mode of enforcement was prevalent early in the RVN conflict when aviators were in short supply and were allowed considerable latitude regarding safety practices. However, violations which then were simply overlooked now warrant appearances before flight evaluation boards. This increased scrutiny is reflected by responses to Question 5 and reveals a replacement of the forgive-and-forget philosophy with one depending on vigorous enforcement of safety programs before accidents occur.

*Question 6. Wise application of the collateral investigation system would be helpful to the aviation safety program.*

*Question 7. The assignment of an aircraft accident rate ceiling, which considers the relative hazard of each unit's operation, is a sound management practice.*

Responses to Question 5 indicated commanders overwhelmingly support the idea of vigorous enforcement of accident prevention programs. The purpose of Questions 6 and 7, then, is to determine commanders' opinions about two methods of enforcing these programs.

Question 6 probes the usefulness of collateral investigations which are a commander's prerogative where aviator negligence is suspected in aviation accidents and can lead to punitive actions. Of all the commanders, 62.5% agreed these investigations would be helpful to aviation safety programs but the amount of agreement decreases at lower command levels. There exist several possible reasons for commanders at lower levels being hesitant to subject fellow aviators to such scrutiny and possible punitive action: (a) lower level commanders are closer in age, rank, experience, and physical contact with their aviators and may be reluctant to bring action against "almost peers" for performance they themselves might not have been

able to improve on, (b) hearsay knowledge of the conduct and consequences of collateral investigations may have resulted in a fear of these actions, or (c) as a method for enforcing aviation safety programs, collateral investigations might not be the best means of enforcement. Regardless, commanders (especially at higher levels) lent support to the use of collateral investigations for enforcing safety programs.

Question 7 requests opinions about accident rate ceilings as a method for enforcing safety programs. The criterion is a given accident rate for each unit based on the risks involved in the unit's operations. Essentially, commanders were undecided on the worth or practicality of this method of enforcement (54.5% against, 19.5% undecided and 26% for). It should be noted, however, that the largest negative reaction (41% strongly disagree + 24% disagree = 65%) came from the brigade/battalion commanders. This response of higher level commanders is not surprising for two possible reasons: (a) it may be recalled that high level commanders overwhelmingly (99%) supported vigorous enforcement of accident prevention programs (Question 5), they strongly (75%) supported collateral investigations of aviator negligence (Question 6), but in the case of accident rate ceilings (Question 7), where they would be directly responsible for success of the accident prevention program, 65% were against such a method of enforcement, and (b) in all fairness to the commanders, it is recognized that in RVN there is rapid turnover in command assignments and, where units do not have an established/effective accident prevention program, it is extremely difficult for a new commander to analyze the accident situation, set up a

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good program and adjust the program as accidents occur all within a few months. It appears, then, the only way accident rate ceilings could be accepted and utilized as a method of enforcing accident prevention programs is after a sound and effective program has been established for each unit. Commanders, understandably, are reluctant to take responsibility for an unsatisfactory safety program established by others. However, where unsatisfactory unit programs exist, some authority has to recognize it and take steps necessary to improve such programs, even if it means removing the commander.

Conclusions:

(a) The safety attitude of inexperienced aviators is highly influenced by unit practices and procedures and, aside from flight school, the unit is the best place to develop a proper safety attitude. (1)

(b) Unit commanders form the safety attitude of inexperienced aviators because they control unit safety practices and procedures. (2)

(c) In combat environs, commanders expect but do not accept higher accident rates and are therefore not willing to trade safety off for mission accomplishment. (3)

(d) A surprisingly large number of commanders (35%) and ASO's (33%) agree safety receives sufficient emphasis only after an accident occurs, lending support to the hypothesis that a tendency to "oil the wheel that squeaks" is a relatively stable phenomenon. (4)

(e) Agreement among 92% of the commanders discloses a dramatic shift away from the forgive-and-forget philosophy about accidents and toward

recognition of the need for vigorous enforcement of accident prevention programs. (5)

(f) Of all commanders, 62.5% agreed collateral investigations were a useful method for enforcing safety programs but the amount of agreement decreased with command level. (6)

(g) As a second method for enforcing safety programs, commanders did not approve (54.5% against, 19.5% undecided and 26% for) of assigning accident rate ceilings to each unit. (7)

Safety Training Requirements of Aviation Units. The previous section focused on enforcement of safety at the unit level in determining who was responsible for forming safety attitudes, why these attitudes exist and what should be done to improve these attitudes. One of the major findings was that aviators' attitudes toward safety are significantly shaped by unit experiences. It follows, then, if proper safety attitudes are not shaped by the time aviators are assigned, safety training requirements have gone lacking and need to be satisfied somewhere other than in combat. The present section investigates these requirements and suggests possible training remedies.

*Question 8. Individual aviators, particularly those at unit level, do not have a good understanding of the Army's aviation accident prevention program.*

If aviators are to develop a proper attitude toward aviation safety, they should understand the Army's overall concept of safety (encompassing the aircraft's entire life cycle) and know their role in the program. However, 55.5% of commanders and 67.5% of ASO's agreed aviators do not have

a satisfactory understanding of the global Army program. Among commanders, this belief is most prevalent (72.5%) at brigade/battalion level, and no group of lower level commanders agreed as strongly as ASO's. If aviators at unit level indeed do not have a clear view of aviation safety's overall program, it is easy to see why aviators fresh out of flight school can have their attitudes toward safety swayed by risky unit practices and even casual remarks by unit commanders. In this same light, it also is not hard to understand difficulties experienced by commanders and ASO's in enforcing unit accident prevention programs; if aviators do not have a solid foundation in aviation safety, it will be difficult for them to understand safety at the unit level and to police their compliance with safety procedures formulated by particular units.

*Question 9. The Army's aircraft accident prevention program should be taught as a subject during flight school.*

Responses to Question 8 revealed aviators do not have a sufficient understanding of the overall aviation safety program. This finding, along with those of the preceding sections, suggests units have enough trouble teaching and enforcing their own safety program without the handicap of aviators not having a good basic understanding of aviation safety. Question 9, then, asks where aviators should be inculcated with this basic understanding. Overwhelmingly (92.5%), the commanders agreed the Army's accident prevention program should be taught as a subject during flight school. The few disagreeing may have reasoned the hectic forced-pace schedule of training during flight school cannot stand yet another subject.

However, additional time required by an Army-wide aviation safety course could prove significant to unit safety programs by reducing accidents and increasing mission accomplishment.

*Question 10. Monthly safety meetings with mandatory subjects should be abolished in favor of more frequent informal discussions of current unit safety problems.*

In Questions 8 and 9, commanders agreed aviators do not have a basic understanding of the Army's safety program and it should be the topic of a course taught in flight school. Question 10 seeks to reveal a further dimension of the problem by asking if monthly safety meetings are compromised by set mandatory subject matter that should have been taught in flight school, and whether these meetings should be changed to more frequent informal information exchange discussions of unit safety problems. To this dual question, the single response (61%) was yes. From Questions 8 and 9 it is clear the commanders recognize a need for formal safety training and feel it should be a flight school subject. The response to Question 10 verifies that they feel basic safety subjects are topics for flight school and should not consume monthly safety meetings where the pressing matters of unit safety require an undivided exchange of views and experiences. The disagreement (32%) evidenced perhaps reflects the opinion of commanders who, through careful planning and execution, are able to successfully combine formal subject matter and current unit safety problems. However, the responses indicate these commanders are in a definite minority and most can ill afford the time and effort required to teach subjects in combat settings that should have been taught in school.



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*Question 11. Ground commanders need additional training in aviation operations such as loading of troops, preparation of PZ's, selection and training of padmasters, observation and reporting of weather conditions, etc.*

The subject of Question 11 diverges from that of other questions in this section but does concern unit training and requires responses from aviation unit commanders, those most familiar with the problem and its results in terms of accidents. Commanders strongly agreed (92%) that ground commanders need additional training in aviation operations. Close and coordinated interaction between aviation and ground personnel is required in all aviation supported operations and the strength of the commanders' response indicates this interaction is not nearly smooth enough. The accident files of USABAAR contain a plethora of information supporting this opinion, suggesting training for aviation supported operations would be properly included in the ground commanders' career courses.

Conclusions:

(a) Aviators do not sufficiently understand the overall concept of aviation safety, making it difficult to teach them unit level safety and to police their compliance with a unit's particular safety requirements. (8)

(b) The Army's safety program should be the subject of a course in flight school because units have enough trouble teaching and enforcing their particular safety requirements without being handicapped by aviators not having a basic understanding of aviation safety and their role in it. (9)

(c) Commanders feel a solid background in aviation safety is a flight school responsibility and should not consume the unit's monthly safety

meetings, where pressing matters of unit safety require frequent informal exchanges of information. (10)

(d) Commanders overwhelmingly (92%) agreed that ground commanders need further training in aviation operations, indicating the interaction between aviation and ground personnel is unsatisfactory and suggesting that aviation supported operations should be included as a topic in ground commanders' career courses. (11)

Role of Aviation Safety Officers. In preceding sections, the role of unit commanders in aviation unit safety and training was explored. The purpose of the present section is to investigate the role of aviation unit ASO's by exploring how they are utilized, where they are needed and command support they receive.

*Question 12. At unit level, the aviation safety officer should be an authorized TO&E position.*

The purpose of Question 12 was to determine current opinion about the utility of ASO positions. In the past, many have subscribed to the theory that each aviator should be responsible for his safety and that of his colleagues. However, commanders (70%) clearly recognized the usefulness of ASO's by endorsing the idea of an authorized TO&E position for them. In spite of this strong support, 19% of the commanders disagreed, perhaps having had unsatisfactory experiences with ASO's. Or, this minority might still subscribe to the notion that, where safety is concerned, each aviator should be his brother's keeper. If this is indeed the case, these commanders should review the discussion of Question 2 where it is noted that

USABAAR's accident files evidence inexperienced aviators taking commanders' even casual remarks as license to trade off safe principles of flight for mission accomplishment; not many experienced aviators want an inexperienced aviator as their keeper when life is on the line. Regardless, it is the policy of most unit commands to appoint ASO's even though no regulatory requirement exists for their establishment as a TO&E position at or below company level, and 70% of the commanders agree it is necessary.

*Question 13. The most qualified and experienced aviation safety personnel are found at battalion level or higher.*

*Question 14. There is a need for well qualified and experienced aviation safety personnel at company level.*

Question 12 queried commanders as to how useful the ASO position is and Questions 13 and 14 ask where the most useful ASO's are and where they are needed.

In response to Question 13, 67% of the commanders indicate the most qualified and experienced ASO's are at battalion level or higher. Higher level commanders strengthened this affirmation by strongly agreeing (89.5% of brigade/battalion and 84.5% of company). Also, their opinion might be more valid than that of lower level commanders because they have worked at both lower and higher levels of command and are in a better position to compare the qualifications and experience of ASO's at both levels. Nevertheless, commanders agree that highest ability ASO's are at upper command levels, which raises the crucial point as to whether this lop-sided distribution of ASO ability is best for aviation accident prevention purposes. It must be asked, whether the most highly skilled ASO's function most

effectively as brigade/battalion level managers or should they be utilized as specialists/technicians, daily sharing their expertise/insight with aviators and commanders at company and platoon levels?

Commanders, responding to Question 14, yield a partial answer to this question with 91.5% agreeing (52% agreeing strongly) a need for well qualified and experienced aviation safety personnel exists at company level. This opinion cannot be interpreted to mean that well qualified ASO's are not needed at higher command levels, but it does strongly indicate that more qualified ASO's are needed at lower levels of command.

*Question 15. A requirement exists for an NCO career field in aviation safety.*

Responses to Question 14 revealed more qualified aviation safety personnel are needed at lower command levels, and Question 15 investigates one yet untapped source of such personnel. Both commanders (63%) and ASO's (76%) agreed a requirement exists for an NCO aviation safety career field. Between commanders and ASO's, strongest agreement was evidenced from ASO's, perhaps because they more fully recognize that, especially in large units, the task of herding aviation safety is more than a one-man job and a trained aviation safety NCO is the logical source of relief. The relatively large undecided group (25.5% platoon, 20.5% all commanders and 16.0% ASO's) may reflect the common practice of appointing aviators, untrained in safety matters, as ASO's. Perhaps the undecided respondents do not understand basic principles of aviation safety or the trained work force required to successfully implement a good accident prevention program. If this assumption

is accurate, the commanders' response to Question 9 (aviation safety should be taught in flight school) takes on further support.

*Question 16. At battalion level, the aviation safety officer should work directly for the CO.*

The power to get things done is commonly granted by close association and within the Army this practice is a *modus operandi*. With this understanding, the purpose of Question 16 was to determine the extent to which commanders recognize ASO's require command emphasis to implement and enforce accident prevention programs. In response, commanders strongly (83%) agreed ASO's should work directly for the CO at battalion level. However, it should be noted that 31% of brigade/battalion commanders disagreed. Background information of those disagreeing revealed they were older than those who agreed, indicating their aviation careers were begun when strong enforcement of safety practices was an exception rather than the rule, perhaps explaining their contrary opinion. Regardless, commanders strongly support having ASO's as a directly reporting member of the commander's team, further verifying the decided shift toward vigorous enforcement of accident prevention programs revealed earlier by Question 5. The move toward enforcement of safety practices has occurred largely during the RVN conflict and the impetus still is not clear. Was it because the rapid aviation build-up required utilization of inexperienced aviators who tended to disregard sound safety procedures, necessitating stronger enforcement? Or, has the requirement for vigorous enforcement always existed but painfully disclosed only by combat in RVN? When RVN "winds down" it will be revealing

to see if enforcement of safety programs also winds down.

*Question 17. Unit aviation safety officers receive adequate command backing.*

By their responses to Question 16, commanders agreed ASO's require command emphasis to implement and enforce safety programs, and Question 17 asks whether the support given ASO's is adequate. Commanders (73%) and ASO's (60%) indicate adequate command backing is provided ASO's. However, very few (15% commanders and 13% ASO's) strongly agreed, and coupled with those who disagreed (20% commanders and 30% ASO's), is an indication that ASO's need more command support in order to successfully implement and enforce accident prevention programs.

Conclusions:

(a) Where aviation safety is concerned, each aviator cannot be his brother's keeper and the need for an authorized TO&E ASO position is clearly recognized. (12)

(b) The most qualified and experienced ASO's are at battalion level or higher and more qualified ASO's are needed at lower command levels. (13,14)

(c) An NCO career field in aviation safety is required because herding aviation safety is difficult for one man (ASO) and a trained NCO is the logical source of relief. (15)

(d) Commanders strongly agree (83%) ASO's should work directly for the CO, further verifying the shift toward vigorous enforcement of aviation safety disclosed by the RVN conflict. (5,16)

(e) Apparently, ASO's receive adequate command backing but require more of the same to better implement and enforce accident prevention programs. (17)

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Aviator Proficiency and IP Instruction. The preceding sections dealt with safety personnel, practices and enforcement. The present section investigates aviators' capacity to be safe, i.e., requirements necessary for his proficiency and requirements necessary for those who train him.

*Question 18. All aviators should be required to pass an open book written examination at least once a year on the aircraft they habitually fly.*

*Question 19. All aviators should be required to pass a closed book written examination at least once a year on emergency procedures on the aircraft they habitually fly.*

Questions 18 and 19 delve into the issues of how necessary annual written exams are, whether they should be open or closed-book exams, what aircraft they should cover and whether emergency procedures should be the subject of a closed-book exam.

In response to Question 18, commanders strongly (94%) agree all aviators should submit to an annual open-book exam on the aircraft they habitually fly. Currently, aviators only must pass a general open-book exam (the annual writ) on instrument flight procedures but the commanders' response indicates that aviators should be examined on the specific aircraft they fly most frequently. A small but noticeable trend can be seen in differing degrees of agreement between brigade/battalion commanders (86%) and company/platoon commanders (95 and 96%). Perhaps the highly experienced aviator/commander at brigade/battalion level views open-book annual writs as (a) more of a chore than a necessity, (b) only necessary in the general type (R/W or F/W) of aircraft flown, or (c) less desirable than closed-book exams.

To the second question (Question 19) about annual written exams, commanders again strongly (88.5%) agreed they should be required. But this time, commanders supported the need for all aviators to pass a closed-book exam on emergency procedures for the aircraft most frequently flown. By comparison, the support (94%) for open-book exams (Question 18) was greater than that (88.5%) for closed-book exams (Question 19), perhaps overshadowing the contrast between a general exam (Question 18) and an emergency-procedures exam (Question 19). In both cases, however, commanders strongly supported requirements for annual-written exams covering the specific aircraft most frequently flown, whether they be open or closed-book or involve standard or emergency procedures. Further, these positive responses to added proficiency requirements lend weight to a major conclusion of preceding sections - the trend is toward greater enforcement of safety requirements.

*Question 20. All aviators should be required to pass a check (standardization) ride at least once a year in the aircraft they habitually fly.*

The previous two questions queried commanders about requirements for written exams and Question 20 asks about the need for annual check rides. Presently, annual check rides are required only at the discretion of unit commanders (not required by DA regulation) and the issue posed by Question 20 is whether all aviators should be required to pass such an annual check ride on the specific aircraft they most frequently fly. Commanders overwhelmingly (91.5%) endorsed this requirement and, in doing so, "closed the loop" on annual proficiency requirements, i.e., they are strongly in favor of both annual-written and check-ride exams that will insure a higher level



of proficiency/safety for aviators. That this is a valid requirement is reflected by the strongest approval coming from company and platoon commanders, those closest to aviators in the operational environment.

*Question 21. Periodic tactical proficiency check rides are not worth the expenditure of manpower and equipment involved.*

Question 20 asked about standardization check rides which cover basic flight skills and emergency procedures and Question 21 inquires about the operational counterpart of standardization check rides, the tactical proficiency check ride. As to whether mission-oriented tactical check rides are worthwhile, commanders (87.5%) said yes. This response, coupled with that of Question 20, clearly indicates that both basic-skill and mission-oriented check rides are required to maintain combat readiness. This finding is supported by the "trouble-shoot and train" practice in RVN where an IP observes the aviator on an operational mission (tactical check) and then, after mission completion, demonstrates necessary corrections in basic flight skills/emergency procedures and has the aviator practice them (standardization check).

*Question 22. During standardization flights and/or unit check-out flights, aviators should expect to practice or receive a demonstration of the emergency procedures most likely to occur in actual operations.*

*Question 23. Even though the training may be more realistic, standardization and proficiency training conducted in aircraft at or near gross weight is taking unnecessary risk.*

*Question 24. A proficiency check (standardization) ride should be flown when it is the only flight commitment the aviator has for that day.*

Questions 20 and 21 assessed the necessity of standardization and tactical proficiency check rides and Questions 22, 23 and 24 seek answers to issues about the content and conduct of these check rides.

As an indication of the thoroughness required in check rides, Question 22 asks whether a demonstration of most-likely-to-be-needed emergency procedures should be expected. Commanders almost unanimously (98.5%) agreed, indicating that the completeness of check rides should not be left to the discretion of IP's and that check rides need an orientation to the operational environment. This finding further supports the necessity of combining standardization and tactical proficiency check rides noted, in the discussion of Question 21, as a common practice in RVN.

As a check on opinions of how far realism should go in proficiency training, Question 23 addresses the issue of whether such training should be conducted in aircraft at or near maximum gross weight. The responses indicated that commanders' opinions were polarized within each level of command (overall, 39.5% agree and 54% disagree), leaning slightly toward disagreement. This response was not surprising since any flight at or near maximum gross weight pushes the odds but, as noted in discussions of Questions 21 and 22, proficiency check rides in RVN are commonly combined with operational missions where the aircraft may very well be at or near maximum gross weight. However, commanders recognize the risks involved and normally require demonstration and practice of standard/emergency procedures after mission completion. This is a contrast in what is done where on proficiency check rides in actual practice, and may account for the polarization

of responses to Question 23. Nevertheless, for reasons only to be conjectured, commanders are split in their opinion on whether to conduct proficiency check rides in aircraft at or near maximum gross weight.

The basic issue of Question 24 is whether an aviator is up to a check ride after flying one or more missions that day, or whether he is up to a mission if he flew a check ride that day. Commanders' responses indicated the same polarization (40% agreed and 52% disagreed) of opinion displayed in Question 23, and perhaps for the same basic reason--proficiency check rides in RVN are commonly combined with operational missions and the disagreement evidenced indicates that commanders are decidedly of two opinions (for reasons unknown) as to whether this is a sound/safe practice. Perhaps this practice was born of necessity, with commanders recognizing the risks involved, but continued where operational commitments disallow separate standardization and tactical proficiency check rides.

*Question 25. Instructor pilots should be limited to a maximum of four hours of instructional flight per day.*

*Question 26. Instructor pilots should be required to take a one hour rest period between instructional flights.*

In the same vein as Question 24, Questions 25 and 26 ask about capabilities necessary for conduct of instructional flights, the subject this time IP's instead of pilots.

Responses to Question 25 reveal commanders (64%) agreeing IP's should be limited to a maximum of four hours instructional flight time daily. As level of command increases, however, degree of agreement decreases (67.5% platoon and 55% brigade/battalion) indicating those closest to IP's on the

flight line feel the length of instructional periods should be limited.

Responses to Question 26, however, were divided (49% agree, 17% undecided and 34% disagree) as to whether IP's should take a one-hour rest period between instructional flights. It is speculated that very few would disagree IP's require some rest between flights, and the ambiguous response to this question perhaps reflects ambiguity inherent in the question. That is, the requirement for a one-hour rest period may have been too specific and many commanders may have reasoned this much is not always needed and the decision on how much rest is required after a particular flight should remain the judgment of IP's.

*Question 27. Instructor pilots should be limited to a set number of touchdown autorotations that they may perform or instruct in one day.*

From 1 July 69 through 30 June 71, practice of touchdown autorotations resulted in 412 mishaps with an aircraft damage cost of \$4.7 million, attesting to the importance of Question 27's subject. Commanders' responses (57% disagree, 18% undecided and 25% agree) indicate, however, IP's should not be limited to the number of touchdown autorotations they perform or instruct in one day. A separate query of aviators serving these commanders found they also preferred to leave this decision to IP's, but stipulated that commanders must know the IP's capabilities before granting this power of decision. Regardless, a recent USABAAR Safety of Flight Message (Appendix C) recommends no more than six practice autorotations be performed during any one-hour instructional period, and then only under carefully controlled conditions.

Conclusions:

(a) Annual written exams should cover standard and emergency procedures on the specific aircraft most frequently flown and may be open or closed-book. (18,19)

(b) Both basic-skill (standardization) and mission-oriented (tactical) check rides are required to maintain flight proficiency and should include demonstrations/practice of emergency procedures most likely to be used. (20,21,22)

(c) Commanders recognize risks involved in check rides at or near maximum gross weight and, in RVN, support practice of standard/emergency procedures only after mission completion. (23)

(d) The practice of combining check rides with operational missions was born of combat environment necessity and commanders are divided as to whether this procedure is best/safe. (24)

(e) Instructional flight periods should be limited to four hours daily for each IP but commanders are undecided as to the length of rest periods required between flights. (25,26)

(f) Commanders and their aviators agree IP's should decide how many practice touchdown autorotations should be performed daily, but USABAAR recommends (Appendix C) only 6 in any given hour under rigidly controlled conditions. (27)

Risk-Taking in the Operational Environment. Previous sections have dealt with safety practices and procedures ancillary to the purpose of combat aviation units, performing operational missions. The present section,

then, treats those survey questions focused on the risks associated with mission accomplishment including flight practices, maintenance, weather and instrument tickets.

*Question 28. Tactical urgency is used too frequently as a reason to ignore the sound principles of flight.*

*Question 29. Individual aviators, more so than the unit commander, seem to be willing to accept unnecessary risks to complete a mission.*

*Question 30. Refueling (POL) areas may be used as troop staging areas during lift operations.*

In urgent tactical situations, commanders try to assign crews with proficiency demanded by the situation. In response to Question 28, however, commanders (60%) agree that tactical situations are used too frequently to ignore sound principles of flight. Even in case of tactical emergencies at night and/or in weather with the most proficient aviators available, the situation still does not excuse abandonment of sound principles of flight. The only way an aviator can get off the hook in tactical emergencies is if he has been sent on a mission that is clearly beyond his capabilities (experience, training or physical/psychological state); then the commander is solely responsible.

Responses of commanders (69.5%) and ASO's (69%) to Question 29 indicates the tendency of aviators to take unnecessary risks to accomplish a mission is very real. This response was not surprising for one or more of the following reasons: (a) most combat aviators are recent flight-school graduates, where it is required they develop and demonstrate a "can-do" attitude, (b) neither the passing of time nor the gaining of

experience has had a chance to temper this can-do attitude into one of trading off risks for gains, (c) young operational pilots fly "where the action is," and witnessing results of their efforts on ground troops' safety has a profound influence motivating them to trade off personal safety to save their buddies, and (d) helicopter pilots are the last bastion of a "silk scarf" mystique that surrounded WWI aviators and perhaps take too many "Red Baron" risks as a result. Regardless, commanders must be alert to the risk-taking behavior of their aviators and take the steps necessary to curtail needless risk taking. Specifically, during mission briefings with inexperienced aviators, commanders could emphasize the dangers/risks inherent in a mission relative to the mission's importance, and aviators could be trained in flight school to make these trade-off decisions.

Another issue of unnecessary risk taking is raised by Question 30. In assault missions commanders are tempted to save time by staging or unloading/reloading troops in POL areas instead of going the extra step for safety and performing these operations in nearby areas. This practice is dangerous because of the large number of troops milling around (perhaps even smoking) in an area with large quantities of fuel and many aircraft maneuvering into position for refueling. An inordinate number of accidents have occurred under these circumstances and commanders (70.5%) generally do not support this practice. However, 62% of brigade/battalion commanders agreed that the use of POL areas for troop staging is an acceptable practice, while company (84%) and platoon (84.5%) commanders overwhelmingly disagreed. It is suspected that this major disagreement is due partially to the type of POL

areas these commanders are familiar with. Refueling (POL) areas at brigade/battalion level usually are airfields where adequate room exists for troops to be clear of the actual refueling area. However, company/platoon commanders deal more with confined unimproved POL areas (often in militarily unsecure territory) where the presence of milling troops is a decided hazard. Nevertheless, too many accidents have occurred with troops in POL areas and commanders, recognizing the dangers inherent, disapprove of the practice.

*Question 31. Aircraft involved in precautionary landings should remain at their location (the hostility of the environment appropriately considered) until proper maintenance authorities have been consulted to determine the feasibility of further flight.*

*Question 32. Aviators who decline aircraft that are overdue for intermediate inspection or some comparable maintenance deficiency are in the minority.*

Questions 31 and 32 seek information on aviators' willingness to take risks where aircraft maintenance is concerned, and to obtain such an indication the subjects of these questions involve two principles of aircraft safety frequently violated by aviators.

In Question 31, commanders overwhelmingly (92%) agreed the decision to continue flight following a precautionary landing should be made by the aircraft commander only if necessitated by circumstances in a hostile environment or after consultation with proper maintenance authorities. The strength of this response was somewhat surprising since, in practice, aviators discovering the cause of relatively minor aircraft difficulties after a precautionary landing often either fix it themselves without calling in or just fly the aircraft back in with the malfunction still present.



However, the commanders' response is more understandable when one considers that most of these commanders' aviators are young and inexperienced and especially if these commanders have witnessed the disastrous consequences of incorrect diagnoses.

The overall response to Question 32 indicates commanders (61.5%) and ASO's (71.5%) feel most aviators decline aircraft overdue for intermediate inspections or comparable maintenance deficiencies. It should be noted, however, 62% of brigade/battalion commanders take the opposite view. Perhaps these brigade/battalion commanders feel maintenance deficient aircraft are accepted because so many accident reports they read cite known maintenance/material deficiencies as a cause (USABAAR accident files support this rationale, especially in the high number of forced landings). Regardless, the commanders' response indicates the practice of accepting maintenance deficient aircraft is widespread enough to account for the large number of accidents/forced landings caused by known maintenance/material malfunctions, and deserves concentrated attention from commanders and maintenance personnel.

*Question 33. Present regulations which permit zero/zero takeoffs should be changed to require that takeoff weather conditions be equal to the landing minima for the departure field.*

*Question 34. Special instrument certificate holders should be required to comply with the minima required of standard instrument certificate holders.*

Questions 33 and 34 require responses to the same basic issue, whether regulations should be changed to disallow takeoff below published field minimums.

Less than 10% of Army aviators have special instrument tickets permitting zero/zero takeoffs, and commanders (43.5% agree, 17.5% undecided and 39% disagree) and ASO's (55.5% agree, 18% undecided and 23% disagree) are basically divided within each level of command on whether this practice should be disallowed. Reasons for this polarization of opinion within each command level perhaps result from two schools of thought: (a) combat commanders recognize tactical emergencies sometimes require takeoffs below minimums but also know such takeoffs are dangerous and should be performed only when absolutely necessary (this might explain the agree responses), and (b) visibility minima had their origin in a F/W aircraft environment (R/W aircraft require lower minima) and most of the commanders surveyed are in charge of R/W aircraft (this might explain the disagree responses).

Presently, a special instrument ticket holder can clear himself for IFR flight and can takeoff below field minima, but a standard instrument ticket holder cannot. In response to Question 34, commanders were basically divided overall (46% agree, 18% undecided and 36% disagree) and within each level of command as to whether special ticket holders should be required to comply with minimum takeoff visibilities imposed on standard ticket holders. Responses to Questions 33 and 34 are strikingly similar, reinforcing the fact that commanders are of two opinions as to whether regulations should be changed restricting all aviators to the takeoff minimums published for each field.

*Question 35. Release of an aircraft for flight into marginal weather conditions should be the responsibility of some higher authority than the aviator assigned to the flight.*

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*Question 36. Flights into weather below 1000' and 3 miles visibility should be cleared by the aviation unit commander or his designee.*

*Question 37. Flights into weather below 500' and 1/4 mile visibility should be cleared by the aviation unit commander or his designee.*

Responses to Questions 33 and 34 indicate that one group of commanders agrees and another disagrees that regulations should be changed restricting all aviators to the takeoff minimums for each field. Given that commanders are of two opinions about regulatory restriction of clearances, Questions 35, 36 and 37 ask whether the responsibility for various clearances should be left with the aviator or some higher authority.

In response to Question 35, commanders were essentially divided (54% disagree and 41% agree) on whether clearance into marginal weather conditions should be the responsibility of some higher authority than the aviator.

To Question 36, the commanders again were basically divided (47.5% agree, 10% undecided and 42.5% disagree) on whether flights into weather below 1000' and 3 miles (VFR takeoff minimums) should be cleared by aviators or unit commander/designees.

However, to Question 37, commanders (67.5% agree and 25.5% disagree) agreed flights into weather below 500' and 1/4 mile (IFR takeoff minimums) should be cleared by the unit commander/designee.

The basic findings, then, to the issue of more weather restrictions or not are: (a) no regulation change regarding special and standard instrument tickets is necessary, (b) flights into marginal (1000'/3 miles

to 500'/1/4 mile) weather can be the responsibility of instrument certified aviators, but (c) flights into weather below 500'/1/4 mile (IFR conditions) should be cleared by the aviation unit commander/designee. These findings indicate commanders are hesitant to delegate unqualified weather-clearance authority, even to well qualified aviators, in the operational/combat environment. This reluctance is well founded in that USABAAR's files evidence a large number of accidents where aviators overestimated their ability to fly operational missions in marginal/deteriorated weather conditions.

*Question 38. The award of the tactical instrument ticket should require demonstration of satisfactory instrument takeoff proficiency.*

*Question 39. Instead of tactical tickets, helicopter pilots should be awarded standard instrument certificates or none at all.*

Questions 33 through 37 revealed commanders are hesitant to delegate weather-clearance authority even to qualified aviators and Questions 38 and 39 ask what degree of instrument qualification is required for combat aviators.

To Question 38, commanders again are divided (54.5% agree and 36% disagree), but this time on whether tactical ticket holders should demonstrate satisfactory instrument takeoff proficiency. The fundamental issue here is, given that tactical tickets are awarded, whether or not aviators should be required to demonstrate a level of instrument proficiency enabling them to safely handle inadvertent IFR conditions. However, commanders at brigade/battalion (67%) and company (49%) level disagreed and platoon commanders (68%) agreed, revealing two sides to this issue. Perhaps,

platoon commanders reasoned aviators, especially tactical ticket holders, need all the instrument proficiency they can get, whereas brigade/battalion and company commanders reasoned tactical ticket holders should never be assigned a mission where they will require instrument takeoff proficiency. Regardless of the logic, these two points of view lead to the topic of Question 39.

The R/W class scheduled to graduate on 30 November 1971 will be awarded standard instrument tickets, making the tactical vs standard instrument controversy a moot issue. Supporting this decision, commanders responding to Question 39 agreed (74.5%) that R/W aviators should be awarded standard instrument tickets or none at all.

It is wondered, nevertheless, whether these commanders have fallen prey to a common misconception about the worth of tactical instrument training. At the beginning of the RVN conflict it was determined operational aviators needed sufficient instrument proficiency to render them effective in the combat environment. However, it was agreed that FAA type instrument proficiency would not suffice, so the tactical instrument ticket program was initiated. Tactical ticket training provided essentially what standard ticket training provided, including tactical procedures, except instrument takeoff proficiency and airways navigation.

Even though the tactical ticket required approximately eight hours fewer than the standard ticket, the tactical ticket program quickly drew charges of "instilling too much confidence into inexperienced aviators" and "tends to make commanders expect too much from tactical ticket holders."

These charges were founded on a considerable number of accidents, but were based on the wrong line of reasoning. Commanders did indeed expect too much instrument proficiency from these aviators but it was because the instrument ticket holders these commanders knew from the past had a great deal of aviation knowledge/experience in addition to an instrument ticket; they were not fresh out of flight school. Secondly, the tactical ticket program did instill false confidence in aviators but only because tactical ticket holders were equated with highly experienced ticket holders of the past. In sum, instrument proficiency of tactical ticket holders has not been on a par with standard ticket holders of the past, not because the program was faulty, but because of general aviation inexperience.

The Army's instrument ticket program, whether it be tactical or standard, warrants still another type of scrutiny.

Many still believe instrument flight training remains too fixed-wing oriented in instruments and procedures to satisfy needs of the rotary-wing aviator. For example, with current instrumentation F/W instrument takeoffs (ITO) require one bar width above the artificial horizon whereas R/W ITO's require one bar width below. Further, F/W and R/W environments are significantly different, e.g., F/W instrument procedures are used mainly at night and/or in weather, but R/W aviators frequently are forced to rely on instruments because the horizon is lost in dust, trees, mountains, and buildings in addition to night and weather. Nevertheless, the standard ticket program is underway and will bear careful scrutiny to determine its success.

Conclusions:

(a) Urgent tactical situations are too frequently used to excuse risk taking beyond sound principles of flight. (28)

(b) The tendency of aviators, especially inexperienced aviators, to take unnecessary risks for mission accomplishment is very real. (29)

(c) Staging of troops in confined refueling (POL) areas is an extremely dangerous practice, no matter how much time is saved. (30)

(d) The decision to continue flight following a precautionary landing should be made by the aviator only if necessitated by hostile-environment circumstances and/or after consulting proper maintenance authorities. (31)

(e) The practice of accepting maintenance deficient aircraft is widespread enough to account for the large number of accidents/forced landings caused by maintenance/material malfunctions. (32)

(f) No change in regulations regarding clearance requirements of special and standard instrument tickets is required, and flights into marginal (1000'/3 miles to 500'/1/4 mile) weather can be the responsibility of instrument certified aviators but flights into weather below 500'/1/4 mile minimums should be cleared by the unit commander/designee. (33,34,35, 36,37)

(g) Commanders feel aviators need all the instrument proficiency they can acquire, but would rather have aviators awarded standard tickets or none at all. (38,39)

Utility of Accident Prevention Information. The first three questions of this section ask how widely safety publications are distributed, how

much they are read and whether their orientation encourages utilization.

A fourth question inquires about a regulation to specifically delineate duties of pilots and co-pilots for all Army aircraft.

*Question 40. Safety publications are found in almost any office on most posts, but often are quite scarce on the flight line.*

*Question 41. The safety publications that do reach the flight line are seldom read.*

*Question 42. Too few safety publications are directed toward the individual aviator.*

To Question 40, commanders (55.5%) and ASO's (71.5%) agreed safety publications are frequently found in offices but are scarce on flight lines. This agreement is by no means unanimous, with considerable disagreement at company (46.5%) and platoon (36.5%) levels. Regardless, safety publications should be available on the flight line because aviators spend considerable time there before/between flights, affording ample time to keep current on aviation safety matters that concern them.

Even if the distribution of safety publications were optimal, are those that reach the flight line utilized? To this question (Question 41) commanders and ASO's were basically divided. This response indicates many safety publications reaching the flight line are seldom read and, in addition to the problem of distribution, there is concern about how aviators can be motivated to read them.

Interest can be generated more easily when the reader is able to identify with/relate to a publication's content. Question 42, therefore, postulated that few safety publications are directed toward the individual



aviator. The response of commanders (61.5%) and ASO's (54%) to this question was mild agreement, indicating safety publications might get wider use if oriented toward the individual aviator.

*Question 43. The Department of the Army should be required to publish a document which specifically delineates the duties of pilots and co-pilots for appropriate Army aircraft during all phases of operation under both instrument and visual flight rules.*

Question 43 posed the question of whether need exists for a document to delineate duties of pilots and co-pilots to aid flight standardization efforts. Failure to delineate pilot/copilot duties has figured in many UH-1 accidents and accident boards have recommended standardization of these duties to improve crew coordination. However, commanders provided only marginal support (48% agree and 35.5% disagree) for this idea. This divided support, perhaps, resulted because commanders may believe unit SOP developed for this purpose is satisfactory and/or are not aware of the problem. Nevertheless, the problem does exist and an acceptable solution must be found.

#### Conclusions:

(a) Safety publications require better flight-line distribution and require more orientation to individual aviator's needs to improve the frequency with which they are utilized. (40,41,42)

(b) USABAAR accident reports reveal many UH-1 mishaps due to poor crew coordination resulting from non-standardized delineation of pilot and co-pilot duties, but commanders provide only marginal support for documentary standardization of such duties in appropriate aircraft. (43)

Flight Evaluation Boards Based on Accident Reports. Results of previous

sections have evidenced support of a trend toward increased enforcement in Army aviation safety. The present section reveals commanders' opinions on one possible method of implementing such enforcement.

*Question 44. USABAAR should be granted the authority to request, on the basis of information provided in the accident investigation reports, aviators who have caused more than one aircraft accident to appear before a Flying Evaluation Board.*

*Question 45. If USABAAR, on the basis stated in the question above, had the authority to request aviators to appear before a Flying Evaluation Board, it would tend to prejudice the report findings of the investigators.*

Question 44 asks whether USABAAR should have the authority to request flight evaluation boards, based on accident reports, for aviators who have caused more than one accident. The commanders were divided (39% agree and 48.5% disagree) on whether USABAAR should have such a role, and disagreement progressed with level of command (41.5% platoon, 63% company and 67% brigade/battalion). Since results of previous sections have conclusively shown commanders endorse more aviation safety enforcement, rationale for the divided opinions evidenced in Question 44 may hinge on (a) use of USABAAR versus unit commanders as the agent of safety enforcement, (b) real value of requiring a flight evaluation board for aviators charged in accident reports with having caused more than one accident, and/or (c) prejudicial influence of a mandatory flight evaluation board on those who prepare the accident report.

In connection with Question 44, the prejudicial influence of mandatory flight evaluation boards was anticipated and Question 45 asked commanders whether they thought such an effect would result if USABAAR could request

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aviators to appear before flight evaluation boards. The commanders expressed agreement (54.5%) that accident reports would reflect such a prejudice. It is evident, then, any one or a combination of the three rationales discussed above could be the basis on which commanders yielded a divided response to the question of USABAAR assuming an enforcement role in aviation safety.

Conclusion:

Commanders are divided as to whether USABAAR should be authorized to request flight evaluation boards, based on accident report findings, for aviators causing more than one accident, and on whether such board actions would tend to prejudice accident report findings. (44,45)

# **APPENDIX A** **BACKGROUND OF RESPONDING COMMANDERS**

<b>Level of Command</b>	<b>CPT</b>	<b>MAJ</b>	<b>LTC</b>	<b>COL</b>	<b>% of Total</b>
Brigade or Battalion	0.0%	0.0%	92.5%	80.0%	10.5%
Company	6.5	92.0	7.5	0.0	34.5
Platoon	86.5	3.5	0.0	0.0	49.5
Level Unreported	7.0	4.5	0.0	20.0	5.5
<b>% of Total</b>	<b>55.5</b>	<b>32.5</b>	<b>9.5</b>	<b>2.0</b>	

## **Years as an Army Rated Aviator**

	<b>Less than 3</b>	<b>3 but less than 6</b>	<b>6 but less than 9</b>	<b>9 but less than 12</b>	<b>More than 12</b>
Brigade or Battalion	0.0%	0.0%	0.0%	11.5%	73.5%
Company	3.5	31.5	91.5	83.0	17.5
Platoon	83.0	59.0	6.5	0.0	6.0
Level Unreported	13.5	9.5	2.0	5.5	3.0
<b>% of Total</b>	<b>47.5</b>	<b>14.0</b>	<b>15.5</b>	<b>12.0</b>	<b>11.5</b>

## **Months in Command**

	<b>Less than 3</b>	<b>3-6</b>	<b>7-8</b>	<b>9-10</b>	<b>11 or more</b>
Brigade or Battalion	6.5%	16.0%	4.0%	0.0%	0.0%
Company	25.0	43.0	30.5	20.0	50.0
Platoon	60.0	39.5	61.5	80.0	50.0
Level Unreported	8.5	1.5	4.0	0.0	0.0
<b>% of Total</b>	<b>42.0</b>	<b>44.0</b>	<b>8.0</b>	<b>3.5</b>	<b>1.5</b>

## **Type of Mission**

	<b>Cargo</b>	<b>Utility</b>	<b>Observation</b>	<b>Attack</b>
Brigade or Battalion	20.5%	41.5%	10.5%	27.5%
Company	27.5	26.5	31.5	14.5
Platoon	20.5	24.5	28.0	26.5
<b>% of Total</b>	<b>22.0</b>	<b>27.0</b>	<b>28.5</b>	<b>22.0</b>

## **Number of Tours in RVN**

	<b>Less than 1 full tour</b>	<b>1 tour now in 2nd tour</b>	<b>2 full tours</b>	<b>More than 2 tours</b>
Brigade or Battalion	2.5%	14.0%	0.0%	17.0%
Company	5.5	47.5	71.5	41.5
Platoon	77.5	33.0	28.5	25.0
Level Unreported	14.5	5.5	0.0	16.5
<b>% of Total</b>	<b>37.5</b>	<b>56.0</b>	<b>2.5</b>	<b>4.0</b>

## **Months Remaining in This Tour**

	<b>Less than 3</b>	<b>3-6</b>	<b>7-8</b>	<b>9-10</b>	<b>11 or more</b>
Brigade or Battalion	10.5%	11.5%	12.0%	2.5%	7.0%
Company	34.5	38.0	29.0	13.0	28.5
Platoon	51.5	39.0	48.5	71.0	43.0
Level Unreported	3.5	11.5	9.5	13.0	21.5
<b>% of Total</b>	<b>36.0</b>	<b>32.5</b>	<b>14.0</b>	<b>12.5</b>	<b>4.5</b>

## APPENDIX B Full Tabulated Results

### UNIT AVIATION SAFETY ENFORCEMENT

QUESTION 1. The inexperienced aviator's attitude toward aviation safety is a reflection of the flight procedures and practices the unit employs to accomplish its operational missions.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	27.5%	36.5%	18.0%	18.0%	0.0%
Company	22.0	55.5	7.5	13.0	2.0
Platoon	21.5	55.5	9.5	9.5	4.0
Level Unreported	25.0	44.0	0.0	31.0	0.0
All Commanders	22.5	53.0	8.5	13.5	2.5
ASO's	45.0	43.5	3.0	6.0	1.5

QUESTION 2. The flight procedures and practices that the unit employs to accomplish its operational missions are a reflection of the unit commander's attitude toward aviation safety.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	55.5%	33.5%	0.0%	5.5%	5.5%
Company	36.5	58.5	0.0	5.0	0.0
Platoon	33.5	51.5	1.5	11.0	2.5
Level Unreported	18.0	54.5	9.5	18.0	0.0
All Commanders	36.0	51.5	1.5	9.0	2.0
ASO's	51.0	42.0	1.5	2.5	2.5

QUESTION 3. In a combat environment, a higher accident rate should be accepted as well as expected.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	0.0%	24.0%	3.5%	52.0%	20.5%
Company	6.0	27.0	2.5	28.5	36.0
Platoon	6.0	21.0	2.0	34.5	36.5
Level Unreported	3.5	33.5	3.5	37.0	22.5
All Commanders	5.5	24.5	2.5	34.5	33.0

QUESTION 4. Only when an accident occurs do safe operations receive sufficient emphasis.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	31.0%	3.5%	48.5%	13.5%
Company	5.5	26.5	1.0	56.5	10.5
Platoon	11.5	24.0	7.0	48.5	9.0
Level Unreported	18.5	22.0	11.0	44.5	4.0
All Commanders	9.5	25.5	5.0	50.5	9.5
ASO's	19.0	24.0	3.5	42.0	11.5

QUESTION 5. To be effective, an accident prevention program, in addition to being well conceived and publicized, needs to be vigorously enforced.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	55.0%	45.0%	0.0%	0.0%	0.0%
Company	55.0	37.0	3.0	1.0	4.0
Platoon	52.5	38.0	3.5	6.0	0.0
Level Unreported	41.0	52.0	0.0	7.0	0.0
All Commanders	52.5	39.5	2.5	4.0	1.5

QUESTION 6. Wise application of the collateral investigation system would be helpful to the aviation safety program.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	17.5%	58.5%	10.5%	10.5%	3.0%
Company	9.5	52.5	13.5	17.0	7.8
Platoon	11.0	49.5	29.0	7.0	3.5
Level Unreported	0.0	59.5	22.0	7.5	11.0
All Commanders	10.0	52.5	21.5	10.5	5.5

QUESTION 7. The assignment of an aircraft accident rate ceiling, which considers the relative hazard of each unit's operation, is a sound management practice.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	7.0%	17.5%	10.5%	24.0%	41.0%
Company	3.0	24.5	16.0	31.5	25.0
Platoon	2.0	22.0	24.0	34.0	18.0
Level Unreported	4.0	23.0	19.0	23.0	31.0
All Commanders	3.5	22.5	19.5	31.0	23.5

QUESTION 10. Monthly safety meetings with mandatory subjects should be abolished in favor of more frequent informal discussions of current unit safety problems.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	25.0%	28.5%	10.5%	18.0%	18.0%
Company	31.0	33.0	7.5	20.0	8.5
Platoon	24.5	35.5	5.5	26.0	8.5
Level Unreported	11.0	48.5	11.0	18.5	11.0
All Commanders	25.5	35.5	7.0	22.5	9.5

## SAFETY TRAINING REQUIREMENTS OF AVIATION UNITS

QUESTION 8. Individual aviators, particularly those at unit level, do not have a good understanding of the Army's aviation accident prevention program.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	10.0%	62.5%	10.0%	17.5%	0.0%
Company	6.5	46.5	9.5	32.5	5.0
Platoon	12.5	44.0	9.5	28.0	6.0
Level Unreported	3.5	41.0	18.5	37.0	0.0
All Commanders	9.5	46.0	10.5	29.0	5.0
ASO's	20.0	47.5	8.0	22.0	1.5

QUESTION 9. The Army's aircraft accident prevention program should be taught as a subject during flight school.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	38.0%	62.0%	0.0%	0.0%	0.0%
Company	40.0	54.0	5.0	1.0	0.0
Platoon	34.0	57.0	7.0	2.0	0.0
Level Unreported	33.5	52.0	7.5	3.5	3.5
All Commanders	36.5	56.0	5.5	1.5	0.5

QUESTION 11. Ground commanders need additional training in aviation operations such as loading of troops, preparation of PZ's, selection and training of padmasters, observation and reporting of weather conditions, etc.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	65.5%	24.0%	3.5%	7.0%	0.0%
Company	60.0	32.0	4.0	4.0	0.0
Platoon	68.5	25.0	3.5	3.0	0.0
Level Unreported	48.5	33.5	11.0	3.5	3.5
All Commanders	64.0	28.0	4.0	3.5	0.5

## ROLE OF AVIATION SAFETY OFFICERS

QUESTION 12. At unit level, the aviation safety officer should be an authorized TO&E position.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	45.0%	31.0%	3.5%	20.5%	0.0%
Company	39.0	36.0	4.0	17.0	4.0
Platoon	26.0	40.5	15.5	16.5	1.5
Level Unreported	22.0	44.5	18.5	11.0	4.0
All Commanders	31.5	38.5	11.0	16.5	2.5

QUESTION 13. The most qualified and experienced aviation safety personnel are found at battalion level or higher.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	34.5%	55.0%	3.5%	7.0%	0.0%
Company	21.0	62.5	4.0	10.5	2.0
Platoon	6.5	48.5	15.5	25.5	4.0
Level Unreported	7.5	44.5	22.0	11.0	15.0
All Commanders	▲ 14.0	53.0	11.5	17.5	4.0

QUESTION 14. There is a need for well qualified and experienced aviation safety personnel at company level.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	62.0%	27.5%	3.5%	7.0%	0.0%
Company	59.0	32.5	0.0	6.5	2.0
Platoon	48.5	44.0	2.0	5.0	0.5
Level Unreported	33.5	55.5	7.5	3.5	0.0
All Commanders	▲ 52.0	39.5	2.0	5.5	1.0

QUESTION 15. A requirement exists for an NCO career field in aviation safety.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	27.5%	38.0%	17.0%	14.0%	3.5%
Company	20.0	49.5	15.0	12.5	3.0
Platoon	18.0	39.0	25.5	15.5	2.0
Level Unreported	11.0	59.5	18.5	11.0	0.0
All Commanders	▲ 19.0	44.0	20.5	14.0	2.5
ASO's	41.0	35.0	16.0	8.0	0.0

QUESTION 16. At battalion level, the aviation safety officer should work directly for the CO.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	48.5%	17.0%	3.5%	27.5%	3.5%
Company	45.0	46.5	1.0	6.5	1.0
Platoon	26.5	55.5	6.0	10.0	2.0
Level Unreported	30.0	48.0	11.0	11.0	0.0
All Commanders	▲ 35.0	48.0	4.5	10.5	2.0

QUESTION 17. Unit aviation safety officers receive adequate command backing.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	10.5%	65.5%	3.5%	20.5	0.0%
Company	16.0	63.0	5.0	16.0	0.0
Platoon	14.5	55.5	9.0	15.5	5.5
Level Unreported	18.5	44.5	7.5	22.0	7.5
All Commanders	▲ 15.0	58.0	7.0	17.0	3.0
ASO's	13.0	47.0	9.0	20.0	10.0

## AVIATOR PROFICIENCY AND IP INSTRUCTION

QUESTION 18. All aviators should be required to pass an open book written examination at least once a year on the aircraft they habitually fly.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	58.5%	27.5%	0.0%	7.0%	7.0%
Company	56.0	39.0	2.0	2.0	1.0
Platoon	67.0	29.0	0.5	2.0	1.5
Level Unreported	66.5	26.0	0.0	7.5	0.0
All Commanders	▲ 62.5	31.5	1.0	3.0	2.0

QUESTION 19. All aviators should be required to pass a closed book written examination at least once a year on the emergency procedures on the aircraft they habitually fly.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	45.0%	31.0%	3.5%	7.0%	13.5%
Company	49.5	34.5	7.5	5.5	3.0
Platoon	67.0	28.0	3.0	1.5	0.5
Level Unreported	59.5	22.0	7.5	7.5	3.5
All Commanders	▲ 58.5	30.0	4.5	4.0	3.0

QUESTION 20. All aviators should be required to pass a check (standardization) ride at least once a year in the aircraft they habitually fly.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	62.0%	24.0%	0.0%	7.0%	7.0%
Company	63.5	29.5	2.0	3.0	2.0
Platoon	72.0	21.0	2.0	2.0	3.0
Level Unreported	59.5	26.0	7.5	3.5	3.5
All Commanders	▲ 67.0	24.5	2.5	3.0	3.0

QUESTION 21. Periodic tactical proficiency check rides are not worth the expenditure or the manpower and equipment involved.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	0.0%	7.5%	11.5%	23.0%	58.0%
Company	1.0	6.5	5.0	49.5	38.0
Platoon	0.0	3.5	7.5	46.5	42.5
Level Unreported	0.0	3.5	11.0	59.5	26.0
All Commanders	0.5	4.5	7.5	▲ 46.5	41.0

QUESTION 22. During standardization flights and/or unit check-out flights, aviators should expect to practice or receive a demonstration of the emergency procedures most likely to occur in actual operations.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	62.0%	38.0%	0.0%	0.0%	0.0%
Company	58.0	42.0	0.0	0.0	0.0
Platoon	66.5	32.5	0.5	0.5	0.0
Level Unreported	55.5	41.0	0.0	0.0	3.5
All Commanders	▲ 62.0	36.5	0.5	0.5	0.5
ASO's	70.0	29.0	0.0	0.5	0.5

QUESTION 23. Even though the training may be more realistic, standardization and proficiency training conducted in aircraft at or near gross weight is taking unnecessary risk.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	17.5%	27.5%	7.0%	27.5%	20.5%
Company	6.5	31.5	6.5	34.5	21.0
Platoon	12.5	26.0	7.5	34.0	20.0
Level Unreported	3.5	41.0	3.5	37.0	15.0
All Commanders	10.0	29.5	▲ 6.5	34.0	20.0

QUESTION 24. A proficiency check (standardization) ride should be flown when it is the only flight commitment the aviator has for that day.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	17.0%	10.5%	48.5%	20.5%
Company	6.5	27.5	3.0	55.5	7.5
Platoon	13.5	34.5	9.0	37.5	5.5
Level Unreported	11.0	29.5	15.0	41.0	3.5
All Commanders	10.0	30.0	▲ 8.0	44.5	7.5



QUESTION 25. Instructor pilots should be limited to a maximum of four hours of instructional flight per day.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	17.0%	38.0%	14.0%	31.0%	0.0%
Company	16.0	46.0	8.5	27.5	2.0
Platoon	23.0	44.5	12.5	18.5	1.5
Level Unreported	11.0	44.5	11.0	29.5	4.0
All Commanders	19.5	▲ 44.5	11.0	23.5	1.5

QUESTION 26. Instructor pilots should be required to take a one hour rest period between instructional flights.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	31.0%	20.5%	45.0%	0.0%
Company	11.5	35.0	21.0	30.5	2.0
Platoon	10.5	39.5	13.5	33.0	3.5
Level Unreported	7.5	63.0	18.5	11.0	0.0
All Commanders	9.5	▲ 39.5	17.0	31.5	2.5

QUESTION 27. Instructor pilots should be limited to a set number of touchdown autorotations that they may perform or instruct in one day.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	27.5%	7.0%	55.0%	7.0%
Company	6.5	22.0	24.5	34.5	12.5
Platoon	5.0	13.5	17.0	49.5	15.0
Level Unreported	11.0	26.0	15.0	37.0	11.0
All Commanders	6.0	19.0	▲ 18.0	44.0	13.0

## RISK-TAKING IN THE OPERATIONAL ENVIRONMENT

QUESTION 28. Tactical urgency is used too frequently as a reason to ignore the sound principles of flight.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	28.5%	25.0%	3.5%	28.5%	14.5%
Company	29.0	38.0	6.5	20.0	6.5
Platoon	21.0	36.0	5.0	32.5	5.5
Level Unreported	18.5	33.5	0.0	37.0	11.0
All Commanders	24.5	▲ 35.5	4.5	28.5	7.0

QUESTION 29. Individual aviators, more so than the unit commander, seem to be willing to accept unnecessary risks to complete a mission.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	31.0%	51.5%	7.0%	10.5%	0.0%
Company	26.0	46.5	7.5	18.0	2.0
Platoon	24.5	46.5	5.5	18.0	5.5
Level Unreported	11.0	26.0	11.0	29.5	22.5
All Commanders	24.5	▲ 45.0	6.5	18.5	5.5
ASO's	30.0	39.0	4.0	20.0	5.0

QUESTION 30. Refueling (POL) areas may be used as troop staging areas during lift operations.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	58.5%	17.0%	21.0%	0.0%
Company	1.0	8.5	6.5	48.5	35.5
Platoon	1.5	6.0	8.0	40.5	44.0
Level Unreported	44.5	48.5	3.5	3.5	0.0
All Commanders	5.5	16.0	8.0	▲ 37.5	33.0

QUESTION 31. Aircraft involved in precautionary landings should remain at their location (the hostility of the environment appropriately considered) until proper maintenance authorities have been consulted to determine the feasibility of further flight.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	31.0%	51.5%	0.0%	14.0%	3.5%
Company	48.5	42.0	3.0	5.5	1.0
Platoon	47.5	46.5	2.5	3.5	0.0
Level Unreported	48.5	44.5	3.5	3.5	0.0
All Commanders	▲ 46.5	45.5	2.5	5.0	0.5

QUESTION 32. Aviators who decline aircraft that are overdue for intermediate inspection or some comparable maintenance deficiency are in the minority.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	58.5%	17.0%	21.0%	0.0%
Company	3.0	23.0	7.5	57.0	9.5
Platoon	2.5	18.5	7.5	49.0	22.5
Level Unreported	3.5	52.0	11.0	26.0	7.5
All Commanders	3.0	27.0	▲ 8.5	46.5	15.0
ASO's	6.5	16.5	4.0	46.0	25.5

QUESTION 33. Present regulations which permit zero/zero takeoffs should be changed to require that takeoff weather conditions be equal to the landing minima for the departure field.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	17.0%	24.0%	17.0%	28.0%	14.0%
Company	11.5	26.5	9.5	41.0	11.5
Platoon	16.5	30.5	24.5	24.5	4.0
Level Unreported	23.0	27.0	7.5	38.5	4.0
All Commanders	15.5	▲ 28.0	17.5	31.5	7.5
ASO's	25.5	33.0	18.0	13.0	10.0

QUESTION 34. Special instrument certificate holders should be required to comply with the minima required of standard instrument certificate holders.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	7.0%	38.0%	14.0%	34.0%	7.0%
Company	10.5	32.5	16.0	33.5	7.5
Platoon	14.0	35.0	20.0	27.5	3.5
Level Unreported	15.0	26.0	18.5	29.5	11.0
All Commanders	12.5	▲ 33.5	18.0	30.0	6.0

QUESTION 35. Release of an aircraft for flight into marginal weather conditions should be the responsibility of some higher authority than the aviator assigned to the flight.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	10.0%	24.0%	0.0%	45.0%	20.5%
Company	12.5	21.0	3.0	41.0	21.0
Platoon	22.0	24.5	5.0	31.5	17.0
Level Unreported	26.0	22.0	7.5	18.5	26.0
All Commanders	18.0	23.0	▲ 4.0	34.5	19.5

QUESTION 36. Flights into weather below 1000' and 3 miles visibility should be cleared by the aviation unit commander or his designee.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	61.0%	7.0%	21.5%	7.0%
Company	9.5	36.0	9.5	40.0	5.0
Platoon	11.5	34.0	10.5	36.5	7.5
Level Unreported	19.0	29.5	11.0	29.5	11.0
All Commanders	11.0	▲ 36.5	10.0	35.5	7.0

QUESTION 37. Flights into weather below 500' and ¼ mile visibility should be cleared by the aviation unit commander or his designee.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	41.5%	27.5%	7.0%	17.0%	7.0%
Company	26.5	44.5	5.0	21.0	3.0
Platoon	22.0	45.5	8.0	16.5	8.0
Level Unreported	27.0	34.5	4.0	23.0	11.5
All Commanders	25.5	42.0	7.0	18.5	7.0

QUESTION 38. The award of the tactical instrument ticket should require demonstration of satisfactory instrument takeoff proficiency.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	0.0%	26.0%	7.0%	52.0%	15.0%
Company	15.0	24.5	11.5	40.5	8.5
Platoon	30.0	38.0	7.0	18.0	7.0
Level Unreported	22.0	41.0	18.5	18.5	0.0
All Commanders	21.5	33.0	9.5	28.5	7.5

QUESTION 39. Instead of tactical tickets, helicopter pilots should be awarded standard instrument certificates or none at all.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	31.0%	27.5%	10.5%	27.5%	3.5%
Company	59.0	20.0	9.5	10.5	1.0
Platoon	53.0	20.5	13.5	11.0	2.0
Level Unreported	66.5	15.0	7.5	11.0	0.0
All Commanders	54.0	20.5	11.5	12.5	1.5

## UTILITY OF ACCIDENT PREVENTION INFORMATION

QUESTION 40. Safety publications are found in almost any office on most posts, but often are quite scarce on the flight line.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	7.0%	55.0%	10.5%	27.5%	0.0%
Company	7.5	42.0	4.0	41.0	5.5
Platoon	9.5	50.0	4.0	32.5	4.0
Level Unreported	11.0	37.0	7.5	37.0	7.5
All Commanders	8.5	47.0	5.0	35.0	4.5
ASO's	19.0	52.5	4.0	21.5	2.5

QUESTION 41. The safety publications that do reach the flight line are seldom read.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	0.0%	27.5%	0.0%	69.0%	3.5%
Company	2.0	26.5	9.5	57.0	5.0
Platoon	5.5	29.5	9.0	50.5	5.5
Level Unreported	3.5	22.5	11.0	44.5	18.5
All Commanders	3.5	27.5	8.5	54.0	6.5
ASO's	5.5	31.0	7.5	51.0	3.0

QUESTION 42. Too few safety publications are directed toward the individual aviator.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	10.5%	46.5%	21.5%	21.5%	0.0%
Company	11.5	45.5	19.0	24.0	0.0
Platoon	15.5	51.5	18.0	15.0	0.0
Level Unreported	15.5	38.5	11.5	34.5	0.0
All Commanders	14.0	▲ 47.5	18.0	20.5	0.0
ASO's	10.5	43.5	8.0	34.0	1.5

QUESTION 43. The Department of the Army should be required to publish a document which specifically delineates the duties of pilots and co-pilots for appropriate Army aircraft during all phases of operation under both instrument and visual flight rules.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	20.5%	24.0%	10.5%	45.0%	0.0%
Company	22.0	21.0	17.0	34.5	5.5
Platoon	18.5	34.0	16.5	25.0	6.0
Level Unreported	11.0	33.5	22.0	30.0	3.5
All Commanders	19.5	▲ 28.5	16.5	30.5	5.0

## FLIGHT EVALUATION BOARDS BASED ON ACCIDENT REPORTS

QUESTION 44. USABAAR should be granted the authority to request, on the basis of information provided in the accident investigation reports, aviators who have caused more than one aircraft accident to appear before a Flying Evaluation Board.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	3.5%	14.5%	14.5%	14.5%	53.0%
Company	8.5	21.0	7.5	38.0	25.0
Platoon	10.5	34.5	13.5	28.0	13.5
Level Unreported	37.0	33.5	18.5	7.5	3.5
All Commanders	11.0	28.0	▲ 12.5	28.0	20.5

QUESTION 45. If USABAAR, on the basis stated in the question above, had the authority to request aviators to appear before a Flying Evaluation Board, it would tend to prejudice the report findings of the investigators.

Level of Command	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Brigade or Battalion	11.0%	37.0%	11.0%	15.0%	26.0%
Company	20.0	39.5	15.0	19.0	6.5
Platoon	18.0	38.0	14.5	23.5	6.0
Level Unreported	18.5	18.5	22.5	29.5	11.0
All Commanders	18.0	▲ 36.5	15.0	22.0	8.5

## APPENDIX C

### Safety of Flight Advisory Message – Practice Touchdown Autorotations

UNCLAS 08-20-71

BAAR-AI-RA

DA-ACSFOR for FOR AV

SUBJ: Safety of Flight Advisory Message – Practice Touchdown Autorotations

1. Mishaps occurring during practice touchdown autorotations continue to be a major problem in Army aviation. During the period 1 Jul 69 through 30 Jun 71, there were 412 reported mishaps which resulted in 1 fatality and 30 injuries. These mishaps represent a total aircraft damage cost of \$4,685,522.
2. Numerous mishaps have resulted from uncontrolled practice of touchdown autorotations. Incorrect pilot technique, inattention, and simple carelessness have contributed to these costly mishaps.
3. The practice of touchdown autorotations are necessary in order to maintain aviator proficiency at a level whereby he can successfully cope with an actual forced landing. The implementation of the following recommendations can reduce unnecessary personnel injuries and material losses while practicing this vital emergency maneuver.
  - a. Touchdown autorotations should be conducted only under the following conditions:
    - (1) During formal courses of instruction at the Aviation School.
    - (2) During formal transition flight training when authorized by the installation commander.
    - (3) Conducted in units to satisfy basic pilot proficiency checkride requirements. The following restrictions should apply to proficiency training:
      - (a) Be controlled at a battalion or higher level as an organized and closely supervised program. Practice touchdown autorotations in units less than battalion size where there is no higher aviation headquarters should be controlled by the approving installation commander.
      - (b) Be conducted only in designated training locations that have air-to-ground communications and crash/fire rescue facilities available and is free from obstructions. A method for the "opening" and "closing" of practice autorotation areas should be established. Reconnaissance of touchdown areas should be conducted to insure surface is clear of obstacles and suitable for a ground run.
      - (c) Be conducted only in dual control equipped helicopters with a qualified instructor pilot who is current and proficient in touchdown autorotations in the type, model and series of helicopter under consideration at one set of the controls.
  - b. Practice touchdown autorotations should be restricted to straight-in approaches (practice hovering autorotations excepted). Practice autorotations involving turns of 90 degrees or greater should not be made to a touchdown.
  - c. Unanticipated surprise practice hovering autorotations should be eliminated except for IP training.
  - d. Power recovery (VFR conditions) to other than an approved touchdown area should be initiated in sufficient time to insure that descent will be terminated at a minimum of 100 feet above ground or highest-obstruction within the practice area.
  - e. For simulated IFR conditions, power should be applied in sufficient time to complete final recovery no lower than 700 feet above ground level.
  - f. Passengers must not be aboard aircraft during the conduct of touchdown autorotations.
  - g. No more than six (6) practice touchdown autorotations per IP and/or student should be performed during any one hour instructional period.
  - h. Aborted takeoffs and autorotations during climb-out on takeoff should be prohibited except:
    - (1) When conducted during formal instruction and with a qualified instructor pilot who is current and proficient in touchdown autorotations in the type, model and series helicopter under consideration at one set of the controls.
    - (2) Actual emergencies.

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- i. Once an aviator or student is qualified, touchdown autorotations should be practiced only to the extent of maintaining proficiency. This practice should conform to a. (3) above.
  4. Recommend renewed command emphasis be directed toward education, training, and supervision of practice touchdown autorotations in order to reduce unnecessary losses.